In The Claims

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18. (Four Times Amended) A method of identifying a mammalian cell containing a mutant Rad51 gene comprising determining the sequence of all or part of an endogenous Rad51 gene of a mammalian cell and comparing said sequence to a known mammalian Rad51 gene sequence of the same mammalian species as said cell.

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21. (Four Times Amended) A method according to claim 19, [wherein a difference in the sequence between the Rad51 gene of said individual and said known Rad51 gene is indicative of a disease state or a propensity for a disease state, and] wherein said difference in the sequence of the Rad51 gene in the individual results in aberrant Rad51 biological activity.

47. (Amended) A method according to claim [21] 53 wherein said disease state is cancer.

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48. (Amended) A method according to claim [22] 47 wherein said cancer is breast cancer.

49. (Amended) A method according to claim [21] 53 wherein said disease state is Xeroderma pigmentosum Type A.

50. A method according to claim [21] 53 wherein said disease state is Xeroderma pigmentosum Type F.

51. (Amended) A method according to claim 18 wherein the [mutation in Rad51]mutant Rad51 gene affects biological activity and wherein said biological activity is selected from the group consisting of nucleic acid binding, filament formation, DNA pairing (i.e. D-loop formation), strand exchange, strand annealing, formation of foci and recombinagenicity.

52. (Amended) A method according to claim 18 wherein the [mutation in Rad51]mutant Rad51 gene affects interaction with p53.

Appendix of Pending Claims
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18. (Four Times Amended) A method of identifying a mammalian cell containing a mutant Rad51 gene comprising determining the sequence of all or part of an endogenous Rad51 gene of a mammalian cell and comparing said sequence to a known mammalian Rad51 gene sequence of the same mammalian species as said cell.

19. (Thrice Amended) A method of identifying a Rad51 genotype of a human individual comprising determining all or part of the sequence of at least one Rad51 gene of said individual and comparing said sequence to a known human Rad51 gene.

21. (Four Times Amended) A method according to claim 19, wherein said difference in the sequence of the Rad51 gene in the individual results in aberrant Rad51 biological activity.

47. (Amended) A method according to claim 53 wherein said disease state is cancer.

48. (Amended) A method according to claim 47 wherein said cancer is breast cancer.

49. (Amended) A method according to claim 53 wherein said disease state is Xeroderma pigmentosum Type A.

50. (Amended) A method according to claim 53 wherein said disease state is Xeroderma pigmentosum Type F.

51. (Amended) A method according to claim 18 wherein the mutant Rad51 gene affects biological activity and wherein said biological activity is selected from the group consisting of nucleic acid binding, filament formation, DNA pairing (i.e. D-loop formation), strand exchange, strand annealing, formation of foci and recombinagenicity.

52. (Amended) A method according to claim 18 wherein the mutant Rad51 gene affects interaction with p53.

53. (New) A method of identifying a mammalian cell containing a mutant Rad51 gene

comprising determining the sequence of all or part of an endogenous Rad51 gene of a mammalian cell and comparing said sequence to a known mammalian Rad51 gene sequence of the same mammalian species as said cell, wherein a difference in the sequence between the Rad51 gene of said individual and said known Rad51 gene is indicative of a disease state or a propensity for a disease state.